REMARKS

INTRODUCTION

Claims 1-24 were previously and are currently pending and under consideration.

Claims 1-24 are rejected.

Claims 1-8 and 10-24 are amended herein.

No new matter is being presented, and approval and entry are respectfully requested.

REJECTIONS UNDER 35 USC § 112, FIRST AND SECOND PARAGRAPHS

In the Office Action, at page 2, claim 24 was rejected under 35 U.S.C. § 112, first and second paragraphs, for the reasons set forth therein. The rejected recitation has been removed. Withdrawal of the rejections is respectfully requested.

REJECTIONS UNDER 35 USC §§ 102 AND 103

In the Office Action, at pages 3-5, claims 1-3, 7-12 and 18 were rejected under 35 U.S.C. § 102 as anticipated by Migdal.

Claim 1, for example, recites sampling the surface at a given rate or resolution with generated sample points, determining automatically sample points that add detail to the surface when displaced by a displacement map by using a local criteria calculated based on displacements of neighboring sample points, and keeping the determined sample points to increase the resolution of the sampled surface.

The process of Midgal is fundamentally different. In Midgal, all sample points are known in advance, which Midgal explicitly relies on. To compute the farthest point, all distances are computed. This is not the same as displacing a surface by sampling the surface and keeping sample points according to a local criteria calculated based on displacements of neighboring sample points according to the displacement map. Furthermore, Midgal's simple process of using a point of greatest distance does not equate to, or require, calculating a local criteria based on displacements of neighboring sample points. Finally, the points considered for

addition in Midgal are not sampled from a surface at a given rate or resolution, rather they pre-exist as points in a pre-determined cloud of points. Points are not sampled from a surface and "displaced", rather their distance from a face is used to determine whether to include/exclude them from a re-resolving of the model.

Claim 2 recites "moving determined sample points to increase detail represented thereby". The determined points in Midgal are only kept/discarded; they are not moved, and they are not moved to increase detail. The same argument applies to claim 3.

Claim 10 recites "defining a surface comprising automatically refining a representation of the surface by generating sample points sampling the surface at a given sample rate, for sample points automatically determining one of a location and a direction of a local feature from a displacement map applied to sample points, and either moving or discarding sample points according to the location or direction of the local feature". Arguments above for claim 1 are applicable. Furthermore, claim 10 recites a location or direction of a local feature. Midgal does not move sample points toward a local feature (it adds/removes pre-determined points from a current resolution), and a furthest point is not equivalent to a local feature. For example, a feature such as a non-furthest point of inflection would not be accounted for in Midgal.

Claim 11 is amended to clarify features that allow efficient application of a displacement map to a model using a uniform surface sampling and by discarding and moving sample points according to the areas of details or features. The cited references do not disclose or suggest this combination of features. Peterson uses an analytical formulation of a NURBS patch and does not use a sampling. See also claim 12, which keeps and displaces sample points according to local features of a displacement map.

Regarding claim 18, the rejection appears to confuse feature direction and face normals. Also, a feature measure is more complex than a farthest distance. The farthest distance is not calculated from a local neighborhood of *displacements* of points. Furthermore, identifying borders of features captures displacement details with high accuracy and is done in parameter space. This is different than the case of Figure 3 of Midgal, whose edges are the result of the computation rather than an active search of where the samples should be located. The portion of column 4, lines 31-48 is inapplicable. This portion describes an incremental pure Delaunay triangulation computation, which does not appear capable of preserving (constrained) identified features.

At pages 6-13, claims 4-6, 13-17, and 19-21 were rejected under 35 U.S.C. § 103 as being unpatentable over Migdal in view of Peterson.

Regarding claim 4, as discussed above, a farthest point is independent of curvature; a non-furthest point can be a point of maximum curvature, and a farthest point can be a point that is not a point of maximum *curvature*. Furthermore, the addition of Peterson is traversed because the better representation of curves in Peterson would have no use in Midgal. Midgal is simply interested in selecting a predetermined point that increases detail. The idea of Midgal is to include points that increase global surface resolution. Peterson increases only local resolution. Furthermore, the rejection proposes the combination because Peterson "better represents curves". Midgal does not represent curves and so improvement to curve representation does not seem to make sense.

Claim 13 recites "subdivision surfaces". This is distinctly different from NURBS. In particular, there is no global U and V direction, which makes Peterson's initial step of selecting a column of patch impossible. Furthermore, a feature map is not shown in Figure 3 of Midgal. A number, e.g. a floating point number that measures criteria, is used to drive the method of claim 13. Figure 3 of Midgal is simply a result and no feature information is used to control the result.

Claims 14 and 15 are distinguishable for reasons mentioned above. Furthermore, the cited references to not discuss "representing the surface with the sample point when the feature criteria indicates that the local neighborhood is not substantially flat; and representing the surface without the point when the feature criteria indicates that the local neighborhood is substantially flat". As discussed above, curvature/flatness is independent of the mere height of a point.

Claims 22 and 23 were rejected under 35 U.S.C. § 103 as being unpatentable over Migdal in view of Peterson and in further view of Immel.

Regarding claim 23, distinctions discussed above are applicable.

Furthermore, claims 1, 10-15, 18, and 23 recite the displacement-map/height-field being applicable to points of any arbitrary surface. The present map, for example, a texture map, a procedure, etc., is a true map in that any domain can be mapped; the map is applicable to any arbitrary domain. Only Midgal was recited as providing a displacement map. However, Midgal only maps pre-existing cloud points into or out of a current surface at a current resolution. If this

can be called a "map", it is a one-time map limited to and defined by the particular cloud being processed. There is no map that can be applied to arbitrary surfaces. For example, if the present map is a procedural map, there is no theoretical limit on the resolution/rate of sampling to which it can be applied. In contrast, Midgal is limited to the resolution of the initial set of data. If the claims are again rejected, Applicant respectfully requests an explanation of where Midgal teaches a domain-independent map/field.

Withdrawal of the rejections is respectfully requested.

DEPENDENT CLAIMS

The dependent claims are deemed patentable due at least to their dependence from allowable independent claims. These claims are also patentable due to their recitation of independently distinguishing features, some of which are discussed above. Withdrawal of the rejection of the dependent claims is respectfully requested.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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